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SECTION 01700
MEASUREMENT AND PAYMENT

PART 1 - MEASUREMENT

- 1.01** The items listed in the proposal shall be considered as sufficient to complete the work in accordance with the plans and specifications. Any portion of the work not listed in the bid form shall be deemed to be a part of the item which it is associated with and shall be included in the cost of the unit shown on the bid form. Payment for the unit shown on the bid form shall be considered to cover the cost of all labor, material, equipment and performing all operations necessary to complete the work in place. The unit of measurement shall be the unit shown on the bid form. Payment shall be based upon the actual quantity multiplied by the unit prices. Where work is to be performed at a lump sum price, the lump sum shall include all operations and elements necessary to complete the work. No payment will be made for any material wasted, unused, rejected, or used for the convenience of the Contractor.

PART 2 - PAYMENT

2.01 CLEARING:

- A. Clearing and Grubbing for the construction of roadways, driveways, sidewalks, drainage pipes, water mains, lift stations, sanitary sewer force mains, and sanitary pipes will be included in the lump sum price for "Clearing".
- B. Remove and Replace/Relocate Fence - Payment will be made at the contract unit price per linear foot for the amount actually installed. Payment will include all costs for removing, storing and reinstalling the existing fence or furnishing and installing a new fence as required by the Engineer or the Owner.
- C. Remove and Replace/Relocate Mailboxes and Signs - There will be no separate payment for mailboxes and signs. Removal and replacement/relocation of mailboxes and signs shall be a subsidiary obligation of the contractor in the restoration of disturbed areas and will include the removal, installing in a temporary location and reinstallation after construction is completed.

- D. Remove and replace Hedges and Shrubs - There will be no separate payment for hedges and shrubs, unless otherwise stipulated. Removal and replacement of hedges and shrubs will be included in the lump sum price for "Clearing".

2.02 EARTHWORK:

- A. Grading of Roadways, construction of ditches, dressing of shoulders, removing and replacing topsoil, and all excavation, backfill, compaction, borrow, testing, staking, and construction supervision shall be included in the contract lump sum price for "Grading".
- B. Mucking - Payment will be made on a contract unit price for each cubic yard removed and replaced. Payment will include excavation, disposal of unsuitable material, borrow, backfilling, compaction and testing.

2.03 EROSION AND SEDIMENTATION CONTROL:

- A. Measurement for erosion and sedimentation control shall be based on the lump sum price as shown on the bid proposal. The cost of erosion control shall include all equipment, labor and materials necessary to comply with the State of Georgia Erosion and Sediment Control Manual. Should there be no item in the bid proposal for the Contractor to bid on for erosion control, the Contractor must incorporate the cost of complying with federal, state, and local agencies in their price for the job.

2.04 STORM DRAINAGE:

- A. Pipe Culverts and Storm Drains - The length of pipe will be paid for on a linear foot basis, as measured along the centerline, from end of pipe to end of pipe. Payment will constitute full compensation for all pipe, joints, filter fabric, bedding, trenching, excavation, backfill, compaction, televising and all incidental labor and material necessary to complete the construction of pipe as required by this section of the specifications.
- B. Manholes and Drainage Structures - Payment will be made on a contract unit price basis. Payment will constitute full compensation for all excavation, formwork, backfill, bedding, compaction, frames, gratings, covers, concrete, brick, all miscellaneous materials and labor necessary to complete the construction.

- C. Headwalls - Payment will be made on a contract unit price of each type. Payment will constitute full compensation for the excavation, formwork, all materials and incidentals necessary to complete the construction.
- D. Sheeting and Bracing - Will not be measured for direct payment and all costs and charges in connection therewith shall be reflected and included in the item of work to which it pertains.
- E. Subgrade Drain - Payment for subgrade drain will be made at the contract unit price per linear foot. Payment will constitute full payment for trenching, furnishing and installing the perforated drain pipe, furnishing and placing the stone backfill, proper backfilling, furnishing and installing the fabric, surface clean-up, acceptable connection to structures, and all work necessary to make the installation complete.
- F. Stone Backfill - Stone backfill will be measured by using the length for which stone is ordered by the Engineer, times a depth of 6-inches, times a width of 2 feet wider than the outside diameter of the pipe barrel. Payment will include the cost of removing and disposing of the unsuitable material and furnishing and placing the stone for area outside of the template described in Item "A".
- G. Sand Backfill - Sand backfill will be measured by using the length for which sand is ordered by the Engineer, times a depth of 1 foot, times a width of 2 feet wider than the outside diameter of the pipe barrel. Payment will include the cost of removing and disposing of the unsuitable material and furnishing and placing the sand for area outside of the template described in Item "A".
- H. Borrow - Payment shall be made for the compacted volume of the borrow material. Compacted volume shall be calculated using a maximum width of 2 feet wider than the outer diameter of the pipe and the depth shall be based on the approved construction plans. If additional width is excavated, it shall be backfilled at Contractor's expense. Payment will include furnishing, hauling, placing and compaction the "borrow" material. Payment will also include disposing of the unsuitable material in an area furnished by the Contractor.

- I. Ditch Excavation - Excavations required for the construction of new ditches and re-grading of existing ditches will be paid for under the lump sum items for "Ditch Excavation". The quantity to be paid for periodically will be determined by the ratio of the linear feet completed to the total linear feet required by the contract. If any ditch construction is added to or deleted from the contract, up to a 25% difference in contract amount, the lump sum amount will be adjusted by the ratio of the linear feet added or deducted to the linear feet required by the contract. The ratio shall be determined by the Engineer.

2.05 GRASSING:

- A. When the season or stage of the project is such that the results of the grassing work cannot be determined, conditional acceptance will be made on the work done. When conditional acceptance is made for the items of work covered, the Contractor shall be entitled to 50% of his bid price for the actual work placed and shall receive the remaining 50% of his bid price when final acceptance is made. Conditional acceptance shall not apply to the remaining items of work, and full bid price payment shall be made when the work is acceptably placed and completed in accordance with the specifications.
- B. Payment for grassing will be made at the contract unit price for the item "Grassing" and such payment shall constitute full compensation for furnishing and placing seed and fertilizer or sod where directed and protecting and maintaining seed or sod in all graded and disturbed areas.

2.06 WATER DISTRIBUTION SYSTEM:

- A. Clearing - There will be no separate measurement for clearing for water lines. Payment will be included in the project lump sum item for "Clearing".
- B. Pipe and Tubing - Payment for pipe and tubing will be made at the applicable unit price per linear foot for the various types and sizes of pipe or tubing which are actually placed, as shown on the plans, or as directed by the Engineer. Excavation, backfill, compaction, testing, and all other incidentals to the placing of the pipe and tubing shall be considered as subsidiary obligations of the Contractor for the completion of the line in place.

The length of mains and branch lines to be paid for will be determined by measurement along the centerline of the various sizes and types of pipe actually furnished and installed, from the center of fitting, and from the center of the main to the end of the branch connection. No deduction will be made for the space occupied by valves and fittings.

- C. Restrained Joints - Shall be paid for by the number of joints for each size actually installed in accordance with the manufacturer's specifications. Payment shall include all material, labor, excavation, accessories and incidentals required to make the installation.
- D. Fittings - Fittings for ductile iron and plastic pipe in the distribution system will be paid for on the basis of the unit price per pound of ductile iron fittings at the weights listed in ANSI/AWWA C153/A21.53 for mechanical joint fittings 4" - 16" and in ANSI/AWWA C110/A21.10 for mechanical joint fittings larger than 16". The adapters necessary to connect to valves shall be considered a part of the line in which they are installed.
- E. Concrete Thrust Blocking - Payment shall be at the contract unit price per cubic yard placed in accordance with the details. Payment shall include all excavation, formwork, concrete, backfill and incidental construction necessary to complete the concrete thrust blocking.
- F. Concrete Thrust Collar - Payment shall be at the contract unit price per installation. Payment shall include the cost of supplying the mechanical joint plug, intermediate flange, reinforced concrete collar and all excavation, backfill formwork and incidental construction necessary to complete the concrete thrust collars.
- G. Polyethylene Tube Encasement - Will be paid for at the contract unit price per linear foot along the centerline of the particular size pipe. Where polyethylene tubing is called for from station to station, this will include polyethylene tubing around all fittings exposed to the soil.
- H. Metallic Detector Tape - No separate payment will be made for tape. The cost of furnishing and placing metallic detector tape shall be included in the contract unit price for installing the pipe.

- I. Tracing Wire - No separate payment will be made for tracing wire. Cost of furnishing and placing tracing wire shall be included in the contract unit price for installing the pipe.
- J. Steel Casing (Jacked or Bored) - Will be paid for at the contract unit price per linear foot for each size of casing installed, which payment shall be full compensation for furnishing all materials, excavation, installation, backfilling, and all incidentals necessary to complete the item.
- K. Valves - Valves in the distribution system will be paid for at the contract unit price for each size and type. Payment will include furnishing and installing the valves, valve boxes, concrete collars, manholes, or vaults.
- L. Connections to Existing Mains with Tapping Sleeves - Payment will be made at the contract unit price. Such payment will include all labor, materials, and equipment necessary to locate, excavate, furnish and install the sleeve, valve, valve box or manhole, concrete collar, the existing main, thrust blocking, backfilling and compaction.
- M. Dry Connections to Existing Mains - Payment for connections of new mains to existing mains will be made at the contract unit price for each type connection and will include all labor and materials required to locate, excavate, cut and connect in an acceptable and workmanlike manner.
- N. Post Hydrants - Payment for post hydrants will be made at the contract unit price. Payment will include furnishing and installing the 2" ball valve, valve box, post hydrant, the concrete collar, thrust block and gravel.
- O. Fire Hydrants - Payment for new fire hydrants will be made at the contract unit price for fire hydrants. Payment will include the cost of furnishing and installing the hydrant, stone reaction blocking and backfilling. The 6-inch pipe from the main line to the hydrant will be paid for separately as 6-inch pipe.
- P. House Service Connections - Payment for House Service Connections will be made at the contract unit price. Payment will include the cost of furnishing and installing the tapping saddle, pipe tap or tee, marking stake,

corporation stop and the curb stop at the property line. The service tubing will be paid for separately at the contract unit price for 1-inch tubing.

- Q. Lower Existing Water Main - Payment will be made at the contract unit prices for the various sizes. Payment will be full compensation for all labor, equipment and materials necessary to lower the main and reconnect existing service laterals.
- R. Offset Existing Water Main - Payment will be made at the contract unit prices for the various sizes. Payment for the offset will be full compensation for all labor, materials and equipment necessary to expose and cut the existing pipe, construct the offset, and reconnect existing service laterals.
- S. Relocate Water Meters - Payment for relocating water meters will be made at the contract unit price. Payment shall include the cost of materials, equipment, and labor necessary for removing and reinstalling the meter and box, reconnecting to existing service, excavating, backfilling and compaction.
- T. Grassing - Payment for Grassing will be paid under the contract item "Grassing". Cost shall include all grassing to restore the disturbed areas.
- U. Cleaning and Disinfecting - No separate payment will be made for cleaning and disinfecting. Cleaning and disinfecting piping in the distribution system will be included in the lump sum and unit prices for the appropriate items.

2.07 WASTEWATER COLLECTION SYSTEM:

- A. Clearing - There will be no separate measurement for clearing for sanitary sewers. Payment will be included in the project lump sum items for "Clearing".
- B. Sewer Pipe - Measurements will be made for the actual linear foot of pipe. No deduction will be made for the space occupied by fittings. Payment for sewers will include cost of excavating all material, testing, backfilling, compaction, cleaning, televising and all work necessary to complete the sewer lines. Payment shall be based on the size and cut which is defined as the distance from the pipe invert to the existing grade above the pipe.

- C. Sheeting and Bracing - No separate payment will be made for bracing and sheeting.
- D. Manholes - Payment for manholes will be made at the unit price for various types. Payment shall include the cost of excavating, dewatering, constructing the manholes in accordance with the plans, furnishing and installing a frame and cover and steps, backfilling and compacting the material around the manhole. Payment shall be based on the diameter and cut which is defined as the distance from the manhole invert to the top of the manhole cover.
- E. Steel Casing (Jacked or Bored) - Will be paid for at the contract unit price per linear foot for each size of casing installed, which payment shall be full compensation for furnishing all materials and including excavation, backfilling, and all incidentals necessary to complete the item.
- F. Tees - Payment will be made at the contract unit price. Payment shall include the fitting, plug and flag stake.
- G. Laterals - Shall be measured from the end of the tee to the point where the lateral reaches the property line. Payment will include furnishing the pipe, backfilling, compaction, plug, marking stake and all items necessary to complete the laterals.
- H. Metal Detector Tape - No separate payment will be made for Tape. Cost of furnishing and placing Metal Detector Tape shall be included in the contract unit price for installing metallic/PVC pipe.
- I. Stubs and Plugs - Shall be paid for at the contract unit price for each stub of the designated diameter. Payment shall include one (1) 4-foot length of pipe, connection to the manhole and a plug suitable for the type of pipe being installed.
- J. Stone Backfill - Stone backfill will be measured by using the length for which stone is ordered by the Engineer, times a depth of 6-inches times a width of 2 feet wider than the barrel of the pipe. Payment will include the cost of removing the unsuitable material below the invert and furnishing and placing the stone. Payment for stone shall only be made when dewatering by well points, or by other means, is not attainable.

- K. Sand Backfill - Sand backfill will be measured and paid by using the length for which sand is ordered by the Engineer, times a depth of 12-inches, times a width of 2 feet wider than the barrel of the pipe. Payment will include excavating the unsuitable material below the invert, furnishing and compacting the sand backfill. Payment will be made for sand borrowed from off-site. If on-site sand is available, it shall be used at no additional cost to the Owner. Payment will also include disposal of unsuitable material off-site.
- L. Borrow - Payment shall be made for the compacted volume of the borrow material. Compacted volume shall be calculated using a maximum width of 2 feet wider than the outer diameter of the pipe and the depth shall be based on the approved construction plans. If additional width is excavated, it shall be backfilled at Contractor's expense. Payment will include furnishing, hauling, placing and compacting the "borrow" material. Payment will also include disposing of the unsuitable material in an area furnished by the Contractor.
- M. Grassing - Payment for grassing will be paid under the contract item "grassing". Cost shall include all grassing to restore disturbed areas.
- N. Connect Gravity Sewer to Existing Manhole - Payment will be made at the contract unit price and will include all materials and work required to make the connection, backfilling, compaction and clean up.
- O. Mandrel, Lateral and Infiltration Tests - No separate payment will be made for these tests.

2.08 LIFT STATION AND FORCE MAIN:

- A. Lift Stations - All work except the force main covered in this subsection will be paid for under the lump sum item for the Lift Station(s). Work described in other sections necessary to make the Lift Station complete will also be included in the lump sum payment for the "Lift Station." Such work will include submersible pumps, site preparation, access road, fencing, grassing, potable water system, electrical, control system, hoist system and clean-up.
- B. Force Mains - Shall be paid for at the contract unit price per linear foot for the various sizes. Payment will

include the pipe, fittings, thrust blocking, excavation, backfilling, compaction, testing, grassing, tracing wire and warning tape. Satisfactory tests must be completed before payment is made.

- C. Air Release Valve and Manhole - Payment will be made at the contract unit price and will include furnishing and installing the valve and manhole, ball valve, piping, saddle, backfilling, compacting, grassing and clean-up.
- D. Sheet piling and Bracing - No separate payment will be made for bracing and sheet piling.
- E. Steel Casing (Jacked or Bored) - Will be paid for at the contract unit price per linear foot for each size of casing installed, and shall include the furnishing of all materials, excavation, backfilling, and all incidentals necessary to complete the item.
- F. Restrained Joints - Shall be paid for by the number of joints for each size actually installed in accordance with the manufacturer's specifications. Payment shall include all material, labor, excavation, accessories and incidentals required to make the installation.
- G. Polyethylene Tube Encasement - Will be paid for at the contract unit price per linear foot along the centerline of the particular size pipe. Where polyethylene tubing is required from station to station, this will include polyethylene tubing around all fittings exposed to the soil.
- H. Connect Force Mains to Existing Structures - Payment for connections of the new force mains with existing structures will be made at the contract unit price for each type connection and will include all labor and materials required to locate, excavate, cut and connect in an acceptable and workmanlike manner.
- I. Borrow - Payment shall be made for the compacted volume of the borrow material. Compacted volume shall be calculated using a maximum width of 2 feet wider than the outer diameter of the pipe and the depth shall be based on the approved construction plans. If additional width is excavated, it shall be backfilled at Contractor's expense. Payment will include furnishing, hauling, placing and compacting the "borrow" material. Payment will also

include disposing of the unsuitable material in an area furnished by the Contractor.

- J. Stone Backfill - Stone backfill will be measured by using the length for which stone is ordered by the Engineers, times a depth of 6-inches times a width of 2 feet wider than the barrel of the pipe. Payment will include the cost of removing the unsuitable material and furnishing and placing the stone.
- K. Sand Backfill - Sand backfill will be measured by using the length for which sand is ordered by the Engineer, times a depth of 12-inches, times a width of 2 feet wider than the barrel of the pipe. Payment will include excavating the unsuitable material below the invert, furnishing and compacting the sand backfill.
- L. Metal Detector Tape - No separate payment will be made for Tape. Cost of furnishing and placing metal detector tape shall be included in the contract unit price for installing the pipe.
- M. Tracing Wire - No separate payment will be made for tracing wire. Cost of furnishing and placing tracing wire shall be included in the contract unit price for installing the pipe.
- N. Grassing - There will be no separate measurement or payment. Grassing shall be a subsidiary obligation of the Contractor in the restoration of disturbed areas.

2.09 PAVEMENT:

- A. Clearing - There will be no separate measurement for clearing for pavements. Payment will be included in the project lump sum item for "Clearing".
- B. Proof-Rolling - Payment for proof-rolling will be made on an hourly basis. The Engineer shall direct these operations and will not order proof-rolling to be made for a period of time less than two (2) hours.
- C. Filter Fabric - Will be paid for at the contract unit price per square yard of sub-base or base covered.
- D. Prime Coat & Tack Coat - Will be paid for at the contract unit price per square yard of base course or pavement covered.

- E. Base Course - Will be paid for at the contract unit price per square yard of completed and accepted base course.
- F. Surface Course - Will be paid for at the contract unit price per square yard of completed and accepted surface course payment.
- G. Remove and Replace Pavement - Payment will be made at the contract unit prices for the various pavement replaced. Where a pipe crosses a street or driveway, payment will be made for the number of square yards of pavement removed and replaced, as described below:

The width of the pavement cut shall be twice the pipe diameter in feet times the depth to invert of pipe from ground surface in yards. Pavement removed beyond this limit will be replaced at the Contractor's expense.

- H. Adjust Existing Inlets, Manholes and Valve Boxes - Payment will be made at contract unit price per each structure adjusted. Price will be full compensation for removal and replacement of castings, adequately adjusting the tops of the structure, properly anchoring the castings, restoring the surface and clean up.
- I. Stone Stabilization for Streets - Payment will be made at the contract unit price for the work authorized and accepted by the Engineer.
- J. Traffic Line Painting - Will be paid for at the contract unit price per linear foot of traffic line painted. Payment will include the cleaning and preparing of surfaces, furnishing of all materials, the application, curing and protection of the painted line, the protection of traffic including necessary warning signs, the furnishing of all tools, machines and all other equipment necessary to complete the striping.
- K. Concrete Pervious Pavement - Payment will be made at the unit price per square yard in place and shall include all base preparation and surface finishing and curing.

2.10 CAST-IN-PLACE CONCRETE:

- A. Curb and Gutter - Payment for concrete curb and gutter sections will be made at the unit price per linear foot for the amount actually installed. Measurement will be along the centerline of the completed and accepted curb.

- B. Paved Drives, Walks, and Fillets - Payment will be made at the unit price per square yard which includes full compensation for grading to a satisfactory section, compaction of subgrade, forming, pouring, tinting and finishing of concrete and clean up. Payment to replace existing sidewalk will be made at the unit price per square yard.
- C. Concrete Steps - Payment will be made at the concrete unit price per riser regardless of width. Payment shall include shaping and compacting the subgrade, forms, tinting, furnishing, placing and finishing the concrete, dressing the area and clean-up.
- D. Removal of Sidewalks, Driveways and Steps - Removal of sidewalks, driveways and steps to be replaced, shall be included in the grading operation. Payment for such removal will be included in the lump sum bid item "Grading".
- E. Concrete Block Retaining Walls - Payment will be made at the contract unit price per linear foot for the various heights constructed and accepted. Payment will be full compensation for all labor, equipment, and materials necessary to perform the necessary excavations, construct the wall, including footing, and backfill behind the wall.
- F. Curing Compound - No separate payment will be made for curing compound. All costs and charges in connection therewith shall be included and reflected in the payment for each type of concrete work.
- G. Flowable Fill - Payment will be made at the unit price per cubic yard in place.

2.11 REHABILITATION PROCEDURES TO RESTORE CONCRETE AND MASONRY STRUCTURES

Payment shall be based on a vertical foot for manholes and on a square foot for all other structures. Depth of manholes shall be measured from the top of the ring and cover to the top of the bench.

END OF SECTION